

PSU Module I—General Information

The general information module explains the data collection for the first two PDA screens including information on the data gatherer(s), field visit date(s), and Federal land ownership. It also contains detailed guidelines for determining if the digital PSU boundary and/or digitized point locations need changing.

General Information I

Definitions

Major Land Resource Area (MLRA). A geographic area, usually several million acres in extent, that is characterized by a particular pattern of soils, climate, water resources, land uses, elevation, topography, and potential natural vegetation. [NSH]

Hydrologic Unit Code (HUC). A hierarchical system developed by the U.S. Geological Survey that divides the United States and the Caribbean area into 21 major regions, 222 sub-regions, 352 accounting units and further subdivided into 2,150 cataloging units that delineate river basins having drainage areas usually greater than 700 square miles. [USGS]

Universal Soil Loss Equation (USLE). An erosion model that estimates average annual soil loss from sheet and rill erosion. Location specific data for the field in which the NRI point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculations. The equation is: $A=RKLSCP$, where:

- A = Computed soil loss per unit area
- R = Rainfall factor
- K = Soil erodibility factor
- L = Slope length factor
- S = Slope percent factor
- C = Cover and management factor
- P = Support practice factor [NAM]

Wind Erosion Equation (WEQ). An erosion model designed to predict long-term average annual soil losses from a field having specific characteristics. $E=f(IKCLV)$, where:

- E = Estimated average annual soil loss expressed in tons per acre per year
- I = Soil erodibility index
- K = Soil ridge roughness factor
- C = Climatic factor
- L = Equivalent unsheltered distance across the field along the prevailing wind erosion direction
- V = Equivalent vegetative cover [NAM]

Importance

The names of the data gatherers and dates of field visits are used in the quality assurance processes.

Guidelines and Clarifications

Data collection for the first PDA screen relates to the entire PSU. The MLRA, HUC, USLE-R, and WEQ-C displayed at the top of the screen are for display purposes only and cannot be changed. Data entry is required for the names of the **data gatherers** for the PSU for the 1997 NRI and the **date of the field visit** to the PSU, if applicable.

PDA Instructions for General Information I

Data entry in the PDA is made for the 1997 data gatherer(s). If more than one data gatherer worked on the PSU, or more than one field visit was made, make multiple data entries to ensure the data are complete.

Examples

As seen on the PDA Screen 1.1 General Information I, the screen has displayed values for MLRA, HUC, USLE-R, and WEQ-C. Other data are filled in for the **data gatherers name** and the **date of the PSU field visit** if applicable.

The screenshot shows a PDA screen titled "27013/010101R:PSU Specific Data". Below the title is a section header "1.1 General Information I". The screen contains several data entry fields: "MLRA" with the value "103", "HUC" with "07020009", "USLE R (rainfall factor)" with "140", and "WEQ C (climatic factor)" with "12". There is a "Note" button next to the MLRA field. Below these are two empty fields for "Gathered by (97)" with the value "Herkimer Smith" entered. Further down is a field for "Date if field visited" with the value "11/01/97". At the bottom of the screen is a navigation bar with icons for "Names", "Dates", "Extras", "Undo", "Find", and "Assist".

General Information II

Definitions

Federal land. A land ownership category designating land that is owned by the Federal Government. It does not include, for example, trust lands administered by the Bureau of Indian Affairs nor the Tennessee Valley Authority (TVA). NRI data are not collected for any year that land is in Federal ownership. [NRI-92]

Primary Sampling Unit (PSU). An area of land, typically square to rectangular in shape, that is approximately 40, 100, 160, or 640 acres. Within the PSU, sample points are assigned. Certain data elements are collected for the entire PSU; others are collected at the PSU points. [NRI-92] The size of the PSU is based on the shape, size, and complexity of the resources being inventoried. In 34 states, PSUs are often 160-acre square parcels measuring 0.5 mile on each side. In the Western United States, PSUs are often 40 or 640 square areas; the 40-acre units are used in most irrigated areas, and the larger PSUs are used in relatively homogeneous areas containing large tracts of rangeland, forest land, or barren land. In the 13 Northeastern States, PSUs are defined to be 20 seconds of latitude by 30 seconds of longitude, ranging from 97 acres in Maine to 114 acres in southern Virginia. In Louisiana and portions of northwestern Maine, PSUs are 0.5 kilometer squares (61.8 acres) [NRI-92]

PSU Support Map. A map used as a permanent record to document the extent and location of where data elements were collected. A separate PSU support map is created for each PSU. A different PSU support map is created for each new data collection activity for which the PSU is included in the inventory sample. For example, a PSU selected for the 1982, 1987, and 1992 inventories has three separate PSU support maps, one for each year. [NRI-92]

PSU File Folder. The folder containing all the original reference materials including the 1982 PSU Base Map, the 1987 PSU photography or map, the 1992 PSU photography or map, PSU soils maps, PSU support maps for each year the PSU was included in the sample, and other data collection materials used for resources inventories. [NRI-97]

Importance

Accurate NRI digital data are essential for proper development of the final 1997 NRI data base, as well as for future activities that will augment and build upon the foundation that this inventory will provide. For development of the final 1997 NRI data base, accurate digital data are needed to digitally derive numerous factors not being collected by data gatherers and to derive data needed in the development of statistical weighting factors. Accurate digital locations will enable NRCS to:

- Use NRI data in developing wall-to-wall interpretations (digital maps) based upon satellite data
- Properly and efficiently link NRI data with numerous other digital data bases
- Make procurement of imagery more efficient
- Broaden utilization of classified imagery in conjunction with historical NRI data
- Take advantage of digital image processing and other technologies during future data gathering activities

Guidelines and Clarifications

Determine if the digital PSU boundary and/or any of the digitized point locations need changing. This requires that a new automated 1997 PSU support map (overlay map) be produced using the current PSU spatial data base provided by the National Cartography and Geospatial Center (NCGC) and the 1997 NRI PSU_Tool software (fig. 1). **The automated 1997 PSU support map is considered a preliminary map until it has gone through all the checking steps provided in these instructions. When the automated 1997 PSU support map passes all checks, and corrections have been made, it will be certified as the official spatial data layer for resources inventory activities.** The automated 1997 PSU support map, materials already in the PSU support file, any new imagery being used for the 1997 NRI, and historical data prerecorded in the PDA must be carefully examined to determine whether changes are necessary. Changes should not be based solely on any one source material, but on careful judgment of the data collector after reviewing **all** imagery, materials, and data. (The quality standard for the PSU spatial data layer is to assure that the physical location of the PSU and PSU points matches the attribute data collected for the inventory years of 1982, 1987, 1992, and 1997.)

Although the PSU spatial data base has already gone through two manual and three automated quality assurance processes, it is prudent and necessary to make absolutely sure that the digital spatial information and the data on record at Iowa State University are properly correlated. Although automated processes have assured that no two PSUs have the same PSU identification number, it is still possible that the identification numbers for two PSUs have been mistakenly switched between polygons. The automated processes have also assured that each PSU point has a number and that the identification number is not repeated within the PSU polygon. Again, it is possible that the point identification numbers have been recorded for the wrong PSU point.

Follow carefully the detailed procedures contained in this module. These procedures are given for checking and, if necessary, making corrections to the following items:

- Identification numbers for the digitized PSU and points
- PSU boundaries
- Point locations within the PSU
- PSU attribute data recorded for 1992 and previous inventory years.

Inconsistencies found during the correlation process of this module will be corrected by the NCGC under the direction of Resources Inventory Support Branch (RISB). This module directs the data collector on how to find and document inconsistencies.

Procedures for PSU Correlation

The resources needed to complete this process are:

- The 1:24,000 scale quadrangle compilation map from which the PSUs and PSU points were originally digitized
- A soils atlas sheet, or if not available, a soils field sheet for each PSU
- The digitized PSU spatial layer provided by NCGC, RISB
- The PSU file folder containing all original reference materials including the 1982 base map and the PSU support maps for the 1982, 1987, and 1992 inventory years
- USGS index map for quadrangle map coverage
- FIPS code list for all the counties within the state
- PDA containing the data collected in 1982, 1987, and 1992

The PSU tool software allows the user to plot hydrography and transportation vector overlays to help with the registration of the PSU to maps, slides, and aerial photographs. Correlation procedures require that some or all of the registration layers are plotted. If the data gatherer cannot satisfactorily register the hydrography and transportation vector overlays to the image, the PSU and/or points should not be corrected solely for that reason. **All** source and support materials should be analyzed before such a decision is made.

Figure 1 is an example automated 1997 PSU support map.

Task 1—Verify the PSU

Verify the PSU is digitized and exists in the spatial data base. Data entry on PDA Screen 1.2 General Information requires data gatherer(s) to determine whether the PSU needs to be redigitized for the PSU boundary and/or PSU points.

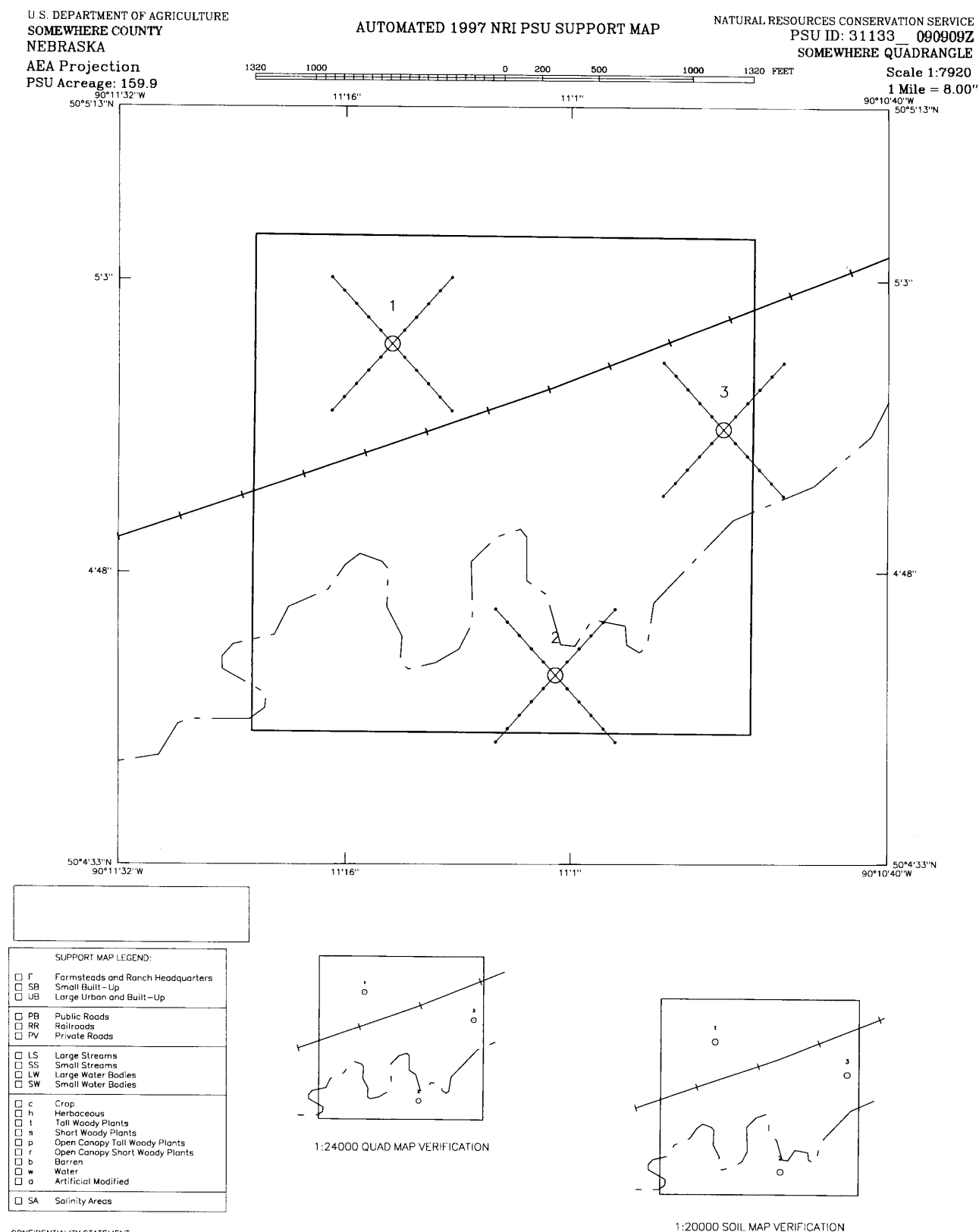
Step 1

According to the directions provided in the 1997 NRI Training Manual and the documentation for the production of the ***Automated 1997 PSU Support Map***, produce an automated 1997 PSU support map for each PSU. Map-window B will be plotted at the scale of the quadrangle compilation map, usually 1:24,000. Map-window C will be used to plot the PSU at the scale matching the published soil survey atlas sheets.

Step 2

If the GIS software does not create a map or the MAPGEN software warns the user that no data are available, check the PSU vector layer for the existence of the PSU polygon in question. Check for the PSU polygon and point(s) by plotting the county, the quadrangle, or by checking the digital data by hand. The existence of the PSU polygon and points in the dig_cats GRASS GIS directory, under the PSU vector file name, does not guarantee the presence of the PSU polygon, or that it was digitized. The most common error found at NCGC is missing PSU polygons. These missing polygons generally fall along the boundaries of the quadrangles where compilation and digitizing were overlooked. **If the PSU or point(s) were overlooked, find the original quadrangle compilation map and send it to RISB. All work must be on the original quadrangle compilation map from which the 1992 digitizing was done, not a photocopy. If the PSU cannot be located on the 1992 original quadrangle compilation map, compile the PSU and PSU point(s) from the original 1982 base map and other PSU file folder source materials onto the quadrangle compilation**

Figure 1 Automated 1997 PSU Support Map



CONFIDENTIALITY STATEMENT:
It is NRCS policy that the locations of the National Resources Inventory (NRI) samples are confidential information. Locations of NRI Primary Sample Units (PSUs), represented in either hardcopy or digital form, are available exclusively for use by NRCS staff conducting resources inventory activities authorized by the Resources Inventory Division.

NOTE:
If more than one LS, SS, LW, or SW then label as 1, 2, 3 etc. (For example: LS1, LS2).
Supplemental TIGER digital line layers provide approximate alignment ONLY.
Aerial DANCE PHOTO INTERPRETATION: 1:25000 150 ft. 1:25000 150 ft.

map and send it to RISB for digitizing. Missing PSUs should be sent in for digitizing as they are discovered.

Task 2—Verify PSU ID

Verify that the identification number for the digitized PSU correctly matches the state and county FIPS code and PSU identification number for the same PSU located in the PSU file folder.

Step 1

Use the hydrography and transportation vector overlay layers to compare the digitized PSU with maps, photographs, and other source materials in the PSU file folder to determine that the digitized PSU and the file folder materials are for the same PSU.

Step 2

Compare the state and county FIPS codes and the PSU identification numbers for both the digitized PSU and the PSU materials in the PSU file folder. If the identification numbers agree, go to **task 3**.

Step 3

If the PSU identification number does not agree with the PSU file folder materials, use a red pencil to line through the incorrect PSU identification number on the automated 1997 PSU support map and on the quadrangle compilation map. Write in the correct identification number. **Do not erase the original label on the quadrangle compilation map.** If red was used for the original compilation, use a blue pencil or another color that is in contrast to the red used on the original compilation work. **All work must be on the original quadrangle compilation map from which the 1992 digitizing was done, not a photocopy.**

Step 4

In the personal digital assistant (PDA), Screen 1.2, General Information II, touch the stylus to screen turning on the **Yes** for the PSU Boundary to register a change is needed for the PSU label. Make a note in PDA, “changed label.”

Task 3—Verify PSU Point ID

Verify that the point identification numbers for the digitized points agree with the point numbers on the source materials contained in the PSU file folder.

Step 1

Compare the PSU point numbers for both the digitized PSU and the PSU point numbers on the source materials contained in the PSU file folder. If the PSU point numbers agree, go to **task 4**.

Step 2

If the point numbers do not agree, use a red pencil to line through the incorrect PSU point number on the automated 1997 PSU support map and on the quadrangle compilation map. Write in the correct point number. If red was used for the original compilation, use a blue pencil or another color that is in contrast to the red used in the original compilation work. **All work must be on the original quadrangle compilation map from which the 1992 digitizing was done, not a photocopy.**

27013/010101R:PSU Specific Data

☒ 1.2 General Information II Note

Do the following digitized locations need to be changed?

PSU boundary ☒ 1 Yes ☐ 0 No

Point 1 ☐ 1 Yes ☐ 0 No

Point 2 ☐ 1 Yes ☐ 0 No

Point 3 ☐ 1 Yes ☐ 0 No

Digitized size of PSU _____

Entirely federal land?

82	87	92	97
0	0	0	0

Names Dates Extras Undo Find Assist

Step 3

In the personal digital assistant (PDA), Screen 1.2,

1:24,000 map scale county boundary. If the PSU is out of the county that corresponds to the PSU identification number FIPS code, use a red pencil to write **Out of County** over the PSU location and draw a red **X** across the PSU point(s).

If only part of a PSU is outside the county that corresponds to the PSU FIPS code, verify that the portion of the PSU outside the county has been deleted (clipped). If not, use a red pencil to write **Out of County** over the portion of the PSU located outside the county boundary shown on the 1:24,000 quadrangle compilation map. If red was used for the original compilation, use a blue pencil or another color that is in contrast to the red used in the original compilation work. Note that any points located within a deleted portion of a PSU shall also be deleted. **All work must be on the original quadrangle compilation map from which the 1992 digitizing was done, not a photocopy.**

Step 6

On the personal digital assistant (PDA), Screen 1.2, General Information II, touch the stylus to screen turning on the **Yes** for the PSU Boundary and the Point (s) to register that a change is needed for the PSU Boundary and Points.

Task 5—Verify PSU Historical Attribute Data

Verify that the PSU attribute data recorded in the PDA for 1982 and subsequent inventory years match the physical locations of the PSU and points shown on the automated 1997 PSU support map.

Step 1

Review the historical data in the PDA and compare entries on soils, land cover/uses, and other data with the physical locations of the points and the area within the PSU boundaries.

Step 2

If the location of a PSU boundary and PSU point(s) match the historical data, compare the location of the digital PSU points with the point locations recorded on maps and/or photographs contained within the PSU file folder. If the distance for PSU points is greater than 100 feet from the original point locations as drawn on the PSU file folder materials, correct the point location on the quadrangle compilation map. However, if by moving the point it would cause the point location to disagree with the historical data in the PDA, then the point should remain where it is. If the materials in the PSU file folder indicate that the data were collected at a different location for 1 of the 3 years, consider the location where 2 of the 3 years agree to be the location that best represents the historical data. If the spatial locations of the PSU and points agree with the historical data and the points are within 100 feet of the location identified in the PSU file folder, data collection for the PSU may begin.

Step 3

If some historical data match the spatial locations and other data do not, the historical data must be checked enough to determine the cause of the inconsistencies. If it is determined that the spatial data layers are correct and that some historical data are in error, proceed with data collection and correct the historical data in the PDA.

27013/010101R:PSU Specific Data

☒ 1.2 General Information II Note

Do the following digitized locations need to be changed?

PSU boundary ☒ 1 Yes ☐ 0 No

Point 1 ☒ 1 Yes ☐ 0 No

Point 2 ☒ 1 Yes ☐ 0 No

Point 3 ☐ 1 Yes ☐ 0 No

Digitized size of PSU _____

Entirely federal land?

82	87	92	97
0	0	0	0

Names Dates Extras Undo Find Assist

Step 4

If the historical data do not match the attribute data recorded in the PDA, try to determine the combination of soils, land cover/uses, and other data that indicates a location where the data were gathered. In other words the digitized location of PSU boundaries and point locations must completely agree with all historical data.

Step 5

If it is determined that the location of the points or PSU boundaries is the cause of the inconsistencies, use a red pencil to draw an **X** over the incorrect point location and place an **X** where the point should be located. If the PSU boundary must be adjusted to match the PSU data, delineate the new boundary in red. If red was used for the original compilation, use a blue pencil or another color that is in contrast to the red used in the original compilation work. **Do not erase the original location of the compiled PSU or PSU points. All work must be on the original quadrangle compilation map from which the 1992 digitizing was done, not a photocopy.**

Step 6

On PDA, Screen 1.2, General Information II, answer **Yes** to PSU boundary changes and/or point(s). Tap the button in the PDA for the appropriate menu entry for changes to the point(s).

Data collection for the PSU may begin at the proper PSU location after the PSU polygon and points have been correlated. Other methods of correlation are not to be used unless approved in advance by the RISB with concurrence of the Resources Inventory Division.

Figure 2 (page 10) shows the tasks that must be completed before data collection begins.

When the digitized locations need to be changed for the PSU boundary and/or points, data collection for the PSU may begin after one of the following is accomplished. The choice made depends on whether the data gathering for the applicable county can be rescheduled.

- The data collection site determines whether an existing support map in the PSU support file accurately reflects the location of the PSU and points. If not, generate a manual 1997 support map. The map must include all the identification information included on the automated 1997 support map. In addition, follow the instructions below for requesting corrections to the PSU spatial data layer from the RISB.
- If the collection site is able to reschedule data collection for the county, follow the instructions for requesting corrections to the PSU spatial data layer for the applicable county. Once the RISB updates the spatial information for the county and provides it to the ICCS, a new automated 1997 PSU support map will be generated at the site, and data gathering can proceed.

27013/010101R:PSU Specific Data

☒ 1.2 General Information II Note

Do the following digitized locations need to be changed?

PSU boundary ☒ 1 Yes ☐ 0 No

Point 1 ☒ 1 Yes ☐ 0 No

Point 2 ☒ 1 Yes ☐ 0 No

Point 3 ☒ 1 Yes ☐ 0 No

Digitized size of PSU _____

Entirely federal land?

82	87	92	97
0	0	0	0

Names Dates Extras Undo Find Assist

Corrections to the PSU Spatial Data Layer

All corrections for the PSU spatial data layer will be done by the NCGC, RISB. Corrections will be made on a county-by-county basis. Do not send any materials for corrections until all PSUs and point locations within a county have been correlated. The exception is for PSUs that were omitted and must be digitized before data collection can begin. When the correlation is complete, send the following information to RISB:

- The **original** quadrangle compilation map from which the PSUs were digitized with all corrections noted on the quadrangle compilation map per above instructions. **Do not fold or tightly roll the maps for mailing.**
- The PSU file folder containing all **original** reference materials including the soils atlas sheet, 1982 base map, and PSU support maps for the 1982, 1987, 1992, and 1997 inventory years. **Do not send copies of the quadrangle compilation maps or the file folder materials.**

For security, the data collection facility should maintain a photocopy of the source materials forwarded to RISB. All original materials will be returned to the data collection facility. After the original materials are returned the data collection facility should destroy any photocopies of the original compilation materials.

RISB will use the original materials to verify that the requested changes are correct before any PSU spatial information is updated. RISB will coordinate corrections with the ISU Statistical Laboratory to insure changes do not create new correlation problems.

PDA Instructions for General Information II

Do the following digitized locations need to be changed? Tap the appropriate **Yes** or **No** boxes on the PDA screen using the 5-step process described earlier in *Procedures for PSU Correlation*.

Digitized size of PSU. The value displayed on the screen is the PSU size based on the PSU spatial data base at NCGC. If necessary, PSU size can be changed by the data gatherer. If the PSU digital spatial data layer has been corrected by NCGC during the data collection process and a new automated 1997 support map has been produced, use PSU size as found in the upper right-hand of this new automated support map. If the digitized PSU boundary needs changing and a manual 1997 support map is being use, then carefully review the prerecorded value.

An error checking routine in the PDA will inform the data gatherer if the prerecorded PSU size is 10 percent larger or smaller than the acres recorded manually for PSU size during the 1992 NRI. For cases where this 10 percent difference exists, ascertain that the PSU size recorded for 1992 is out of tolerance and confirm that the displayed size is correct.

Entirely Federal land? Use the pulldown menu to answer **Yes** or **No**. If there is any non-Federal land, any portion of a large waterbody, or any portion of a large stream within the PSU boundary, the PSU is considered not entirely Federal and this question is answered **No**. If the PSU contains all Federal land, except for a small stream and/or small waterbody completely surrounded by Federal land, the PSU is considered entirely Federal and the question is answered **Yes**.

If the answer is **No**, other PDA screens become available for data entry. If answered **Yes**, the data gatherer is asked to evaluate whether any census water is present on the PSU. This extra question is asked because instructions for the 1992 NRI did not emphasize the definitions of water and Federal land, and it would have been relatively easy to misclassify some census water as Federal in 1982, 1987, and/or 1992. Data gatherers are also asked to confirm that a PSU classified as entirely Federal

for 1982, 1987, or 1992 does not contain some census water. (Note: If the designation is changed to not entirely Federal, the data elements for the year of the change will become unlocked and data entry will be required as usual.) If it is confirmed that the PSU is entirely Federal, data gathering for the PSU is complete.

Completion check. Upon completion of data entry for this screen, tap the completion check box to verify data entry. Resolve any reported edit checks.

PSU Module I Glossary

(The following definitions were extracted from the 1997 National Resources Inventory Glossary.)

PSU Base Map. A large scale map or photo showing the location of the PSU boundaries and point